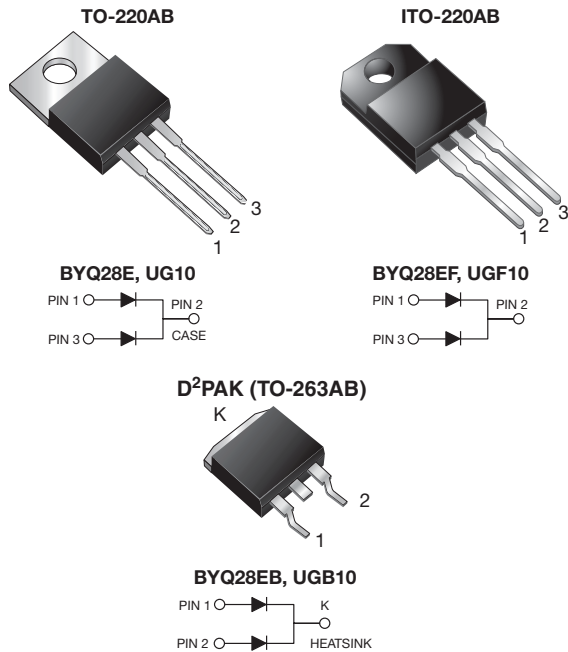




**THE DATASHEET OF
BYQ28EF-150-E3/45**



Dual Common Cathode Ultrafast Rectifier



FEATURES

- Power pack
- Glass passivated pellet chip junction
- Ultrafast recovery times
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C for D²PAK (TO-263AB package)
- Solder dip 275 °C max. 10 s, per JESD 22-B106 (for TO-220AB and ITO-220AB package)
- AEC-Q101 qualified available
- Automotive ordering code: base P/NHE3 (for ITO-220AB and D²PAK (TO-263AB package))
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching power supplies, freewheeling diodes, DC/DC converters and polarity protection application.

DESIGN SUPPORT TOOLS AVAILABLE



3D Models

| PRIMARY CHARACTERISTICS | |
|-------------------------|---------------------------------------|
| $I_{F(AV)}$ | 2 x 5.0 A |
| V_{RRM} | 100 V to 200 V |
| I_{FSM} | 55 A |
| t_{rr} | 25 ns |
| V_F | 0.895 V |
| T_J max. | 150 °C |
| Package | TO-220AB, ITO-220AB, D²PAK (TO-263AB) |
| Circuit configuration | Common cathode |

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, D²PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified ("_X" denotes revision code e.g. A, B,...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs max.

| MAXIMUM RATINGS ($T_C = 25\text{ °C}$ unless otherwise noted) | | | | | |
|--|----------------|-------------|------------|------------|------|
| PARAMETER | SYMBOL | UG10BCT | UG10CCT | UG10DCT | UNIT |
| | | BYQ28E-100 | BYQ28E-150 | BYQ28E-200 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 150 | 200 | V |
| Working peak reverse voltage | V_{RWM} | 100 | 150 | 200 | V |
| Maximum DC blocking voltage | V_{DC} | 100 | 150 | 200 | V |
| Maximum average forward rectified current at $T_C = 100\text{ °C}$ total device per diode | $I_{F(AV)}$ | 10 | | | A |
| | | 5.0 | | | |
| Peak forward surge current 8.3 ms single half sine-wave | I_{FSM} | 55 | | | A |
| Non-repetitive peak reverse current per diode at $t_p = 100\text{ }\mu\text{s}$ | I_{RSM} | 0.2 | | | A |
| Electrostatic discharge capacitor voltage, human body model: C = 250 pF, R = 1.5 k Ω | V_C | 8 | | | kV |
| Operating junction and storage temperature range | T_J, T_{STG} | -40 to +150 | | | °C |
| Isolation voltage (ITO-220AB only) from terminal to heatsink t = 1 min | V_{AC} | 1500 | | | V |



| ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|--|---|-----------------------------------|-------------|-----------------------------------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | VALUE | UNIT |
| Maximum instantaneous forward voltage per diode | $I_F = 10\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 1.25 | V |
| | $I_F = 5\text{ A}$ | | | 1.10 | |
| | | | | $T_J = 150\text{ }^\circ\text{C}$ | |
| Maximum reverse current per diode at working peak reverse voltage | | $T_J = 25\text{ }^\circ\text{C}$ | I_R | 10 | μA |
| | | $T_J = 100\text{ }^\circ\text{C}$ | | 200 | |
| Maximum reverse recovery time per diode | $I_F = 1.0\text{ A}$, $dI/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$ | | t_{rr} | 25 | ns |
| Maximum reverse recovery time per diode | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$ | | t_{rr} | 20 | ns |
| Maximum stored charge per diode | $I_F = 2\text{ A}$, $dI/dt = 20\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$ | | Q_{rr} | 9 | nC |

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

| THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|---|-----------------|--------|---------|---------|---------------------------|
| PARAMETER | SYMBOL | UG10 | UGF10 | UGB10 | UNIT |
| | | BYQ28E | BYQ28EF | BYQ28EB | |
| Typical thermal resistance per diode, junction to ambient | $R_{\theta JA}$ | 50 | 55 | 50 | $^\circ\text{C}/\text{W}$ |
| Typical thermal resistance per diode, junction to case | $R_{\theta JC}$ | 4.5 | 6.7 | 4.8 | |

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|-----------------------------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | BYQ28E-200-E3/45 | 1.80 | 45 | 50/tube | Tube |
| ITO-220AB | BYQ28EF-200-E3/45 | 1.95 | 45 | 50/tube | Tube |
| D ² PAK (TO-263AB) | BYQ28EB-200-E3/45 | 1.77 | 45 | 50/tube | Tube |
| D ² PAK (TO-263AB) | BYQ28EB-200-E3/81 | 1.77 | 81 | 800/reel | Tape and reel |
| ITO-220AB | BYQ28EF-200HE3_A/P ⁽¹⁾ | 1.95 | P | 50/tube | Tube |
| D ² PAK (TO-263AB) | BYQ28EB-200HE3_A/P ⁽¹⁾ | 1.95 | P | 50/tube | Tube |
| D ² PAK (TO-263AB) | BYQ28EB-200HE3_A/I ⁽¹⁾ | 1.95 | I | 800/reel | Tape and reel |

Note

(2) AEC-Q101 qualified, available in ITO-220AB and D²PAK (TO-263AB) package



RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

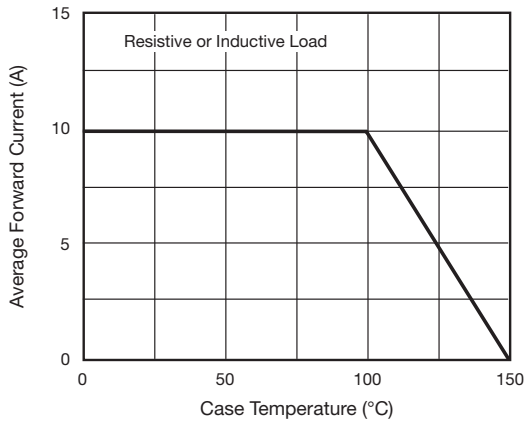


Fig. 1 - Forward Current Derating Curve

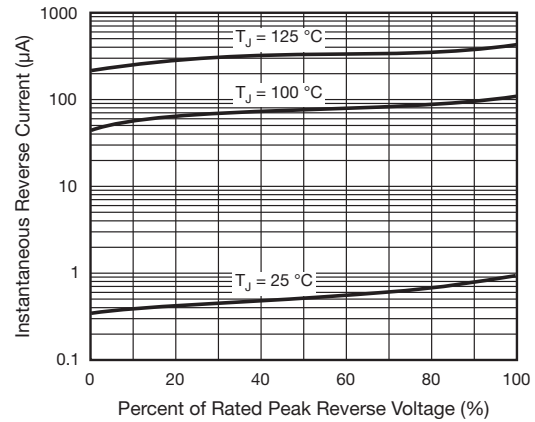


Fig. 4 - Typical Reverse Characteristics Per Diode

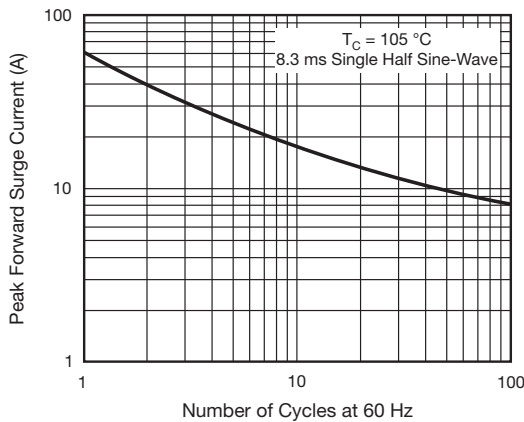


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Diode

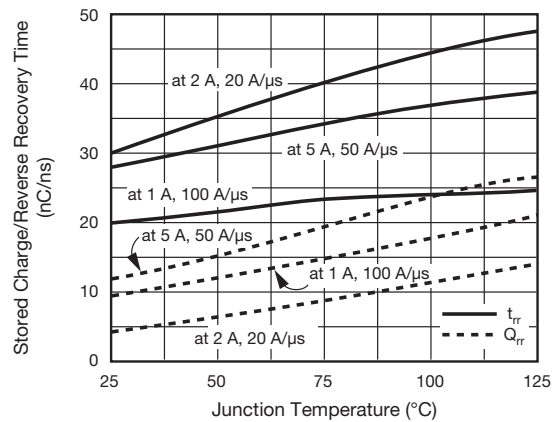


Fig. 5 - Reverse Switching Characteristics Per Diode

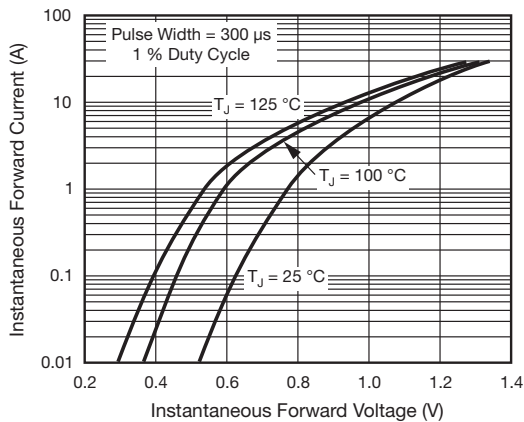


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

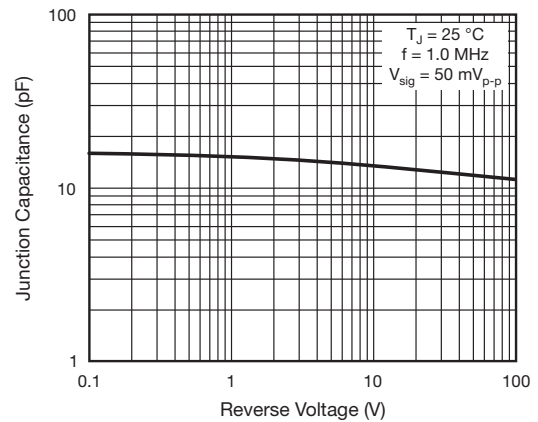
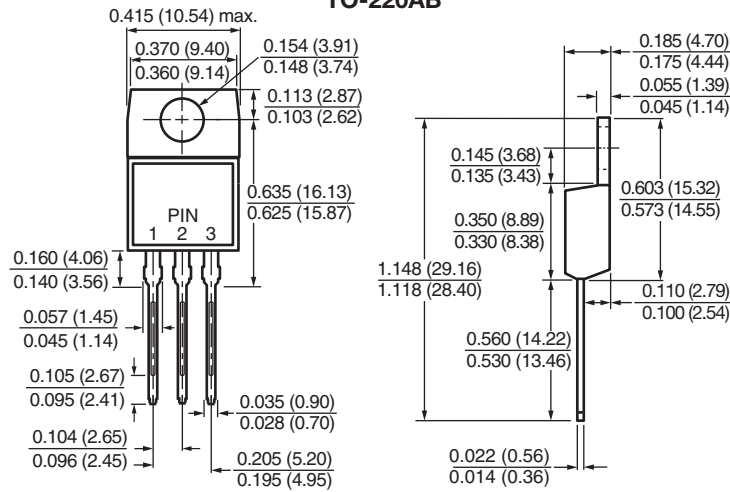


Fig. 6 - Typical Junction Capacitance Per Diode

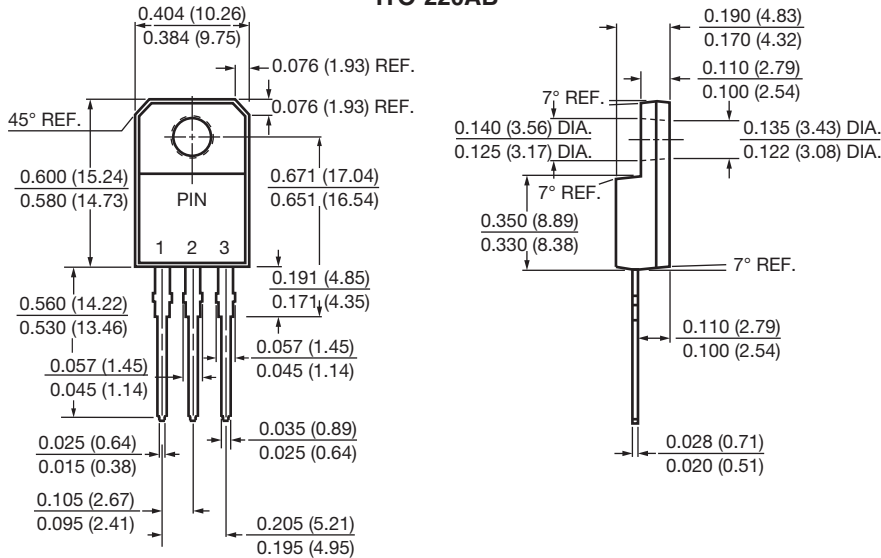


PACKAGE OUTLINE DIMENSION in inches (millimeters)

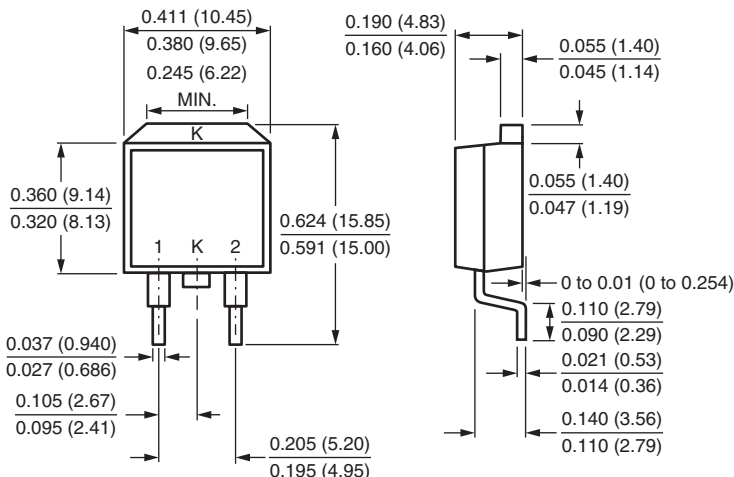
TO-220AB



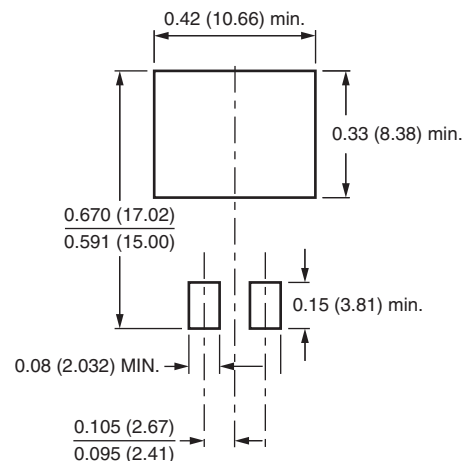
ITO-220AB



D²PAK (TO-263AB)



Mounting Pad Layout





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